

Thermal Insulation Performance

PART L OF THE BUILDING REGULATIONS

Changes to Part L (conservation of fuel and power) of the Building Regulations for England and Wales came into force on 6th April 2006. The aim is to meet the requirements of The Energy Performance of Buildings Directive (EPBD) which aims to further combat climate change and requires buildings to be better insulated and make more use of more efficient heating systems.

The revised Part L will also make air leakage pressure testing of buildings mandatory, thereby improving compliance with the regulations.

The use of Robust Details for airtightness of dwellings may provide an alternative to routine testing, although at present the required details have not yet been developed.

The approved documents have been subdivided into 4 sections:-

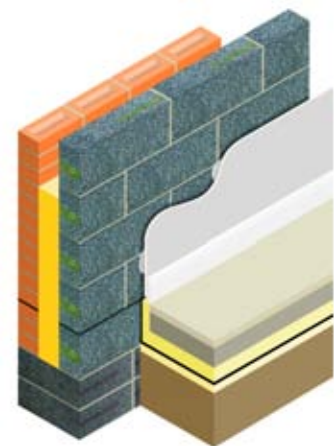
▶	Part L1A	work in new dwellings
▶	Part L1B	work in existing dwellings
▶	Part L2A	new buildings other than dwellings
▶	Part L2B	work in existing buildings other than dwellings

The guidance in Approved Document L1A is limited to new dwellings with a total floor area not greater than 450m². For dwellings exceeding this size, and for compliance with Part L2A new buildings other than dwellings, compliance can be assessed using a calculation procedure known as the Simplified Building Energy Model.

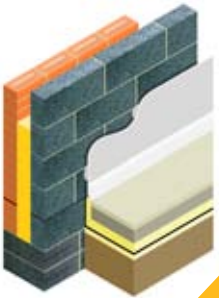
Conservatories with a floor area greater than 30m² have to comply with AD L1.

Although the performance values of the building envelope will depend on factors such as air permeability values, fuel type and heating efficiency it is likely that wall U-values of around 0.30 W/m²K will be required.

In this section, Plasmor show the U-values achieved using a range of Plasmor blocks utilising a variety of insulation materials. These give you a choice of simple and cost effective solutions to help you meet these regulations and using Plasmor blocks in a traditional building construction means there are extra benefits - thermally and acoustically proficient with a high durability and longevity.



Plasmor Concrete Block Solutions

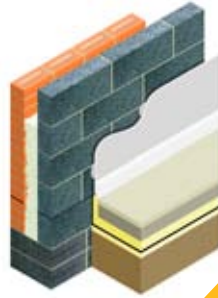


BLOCKWORK
100mm **FIBOLITE**

INSULATION
100mm Rockwool

INTERNAL FINISH
Plasterboard on dabs

U-Value = **0.28W/m²K**

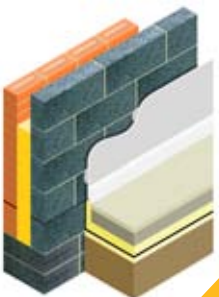


BLOCKWORK
100mm **FIBOLITE**

INSULATION
100mm Polypearl Plus

INTERNAL FINISH
Plasterboard on dabs

U-Value = **0.28W/m²K**



BLOCKWORK
100mm **FIBOLITE**

INSULATION
85mm Dritherm Cavity Slab 32

INTERNAL FINISH
50mm Gyproc Thermaline Basic

U-Value = **0.22W/m²K**



BLOCKWORK
100mm **FIBOLITE**

INSULATION
50mm Kingspan TW50

INTERNAL FINISH
Plasterboard on dabs

U-Value = **0.27W/m²K**



BLOCKWORK
100mm **AGLITE**

INSULATION
50mm Celotex

INTERNAL FINISH
Plasterboard on dabs

U-Value = **0.28W/m²K**



BLOCKWORK
100mm **AGLITE**

INSULATION
100mm Rockwool

INTERNAL FINISH
plasterboard on dabs

U-Value = **0.28W/m²K**



BLOCKWORK
100mm **STRANLITE**

INSULATION
50mm Kingspan TW50

INTERNAL FINISH
Plasterboard on dabs

U-Value = **0.29W/m²K**



BLOCKWORK
100mm **STRANLITE**

INSULATION
100mm Rockwool

INTERNAL FINISH
Plasterboard on dabs

U-Value = **0.28W/m²K**

The illustrations shown here are just a few examples of wall constructions that achieve 0.30 W/m²K or better. For further information or calculations contact our Technical Department.

SAP ENERGY RATING SERVICE

Our fully trained support staff, using government approved computer software, can work with you to produce SAP rating certificates for your projects - contact our technical sales offices to discuss our service and charges.

U-values achieved using a range of Plasmor blocks

FULL FILL CAVITY

 Green figures = achieves 0.30 W/m²K or better

Brick outer leaf 300mm (max) wall width		Rockwool Cavity Wall Batts			Drittherm Cavity Slab		Isowool CWS		Drittherm Cavity Slab 32			Isowool Hi-Cav 32		
k - value		0.037			0.037		0.036		0.032			0.032		
Finish		80mm	90mm	100mm	85mm	100mm	85mm	100mm	75mm	85mm	100mm	75mm	85mm	100mm
100mm Fibolite	Lightweight Plaster	0.35	0.32	0.29	0.33	0.29	0.32	0.28	0.32	0.29	0.26	0.32	0.29	0.26
	Plasterboard on dabs	0.33	0.31	0.28	0.32	0.28	0.31	0.28	0.31	0.29	0.25	0.31	0.29	0.25
100mm Aglite	Lightweight Plaster	0.35	0.32	0.30	0.34	0.30	0.33	0.29	0.33	0.31	0.26	0.33	0.31	0.26
	Plasterboard on dabs	0.34	0.31	0.29	0.33	0.29	0.32	0.28	0.32	0.29	0.26	0.32	0.29	0.26
100mm Stranlite	Lightweight Plaster	-	0.33	0.30	0.35	0.30	0.34	0.30	0.34	0.31	0.27	0.34	0.31	0.27
	Plasterboard on dabs	0.35	0.32	0.30	0.33	0.29	0.33	0.29	0.33	0.30	0.26	0.33	0.30	0.26

FULL FILL CAVITY - blown or injected insulants

Brick outer leaf 300mm (max) wall width		Polypearl Plus		Instafibre/ Energysaver		Ecobead Platinum			
k - value		0.037		0.039		0.033			
Finish		85mm	100mm	75mm	85mm	100mm	75mm	85mm	100mm
100mm Fibolite	Lightweight Plaster	0.33	0.29	-	0.34	0.30	0.33	0.30	0.27
	Plasterboard on dabs	0.32	0.28	0.35	0.33	0.29	0.32	0.29	0.26
100mm Aglite	Lightweight Plaster	0.34	0.30	-	0.35	0.31	0.34	0.31	0.27
	Plasterboard on dabs	0.33	0.29	0.35	0.34	0.30	0.32	0.29	0.26
100mm Stranlite	Lightweight Plaster	0.35	0.30	-	-	0.32	0.35	0.32	0.28
	Plasterboard on dabs	0.33	0.29	-	0.35	0.31	0.34	0.31	0.27

FULL FILL CAVITY - Insulated Plasterboards

Brick outer leaf 300mm (max) wall width		Drivetherm Cavity Slab 32		
k - value		0.032		
Finish		75mm	85mm	100mm
100mm Fibolite	50mm Gyproc Thermaline Super	0.20	0.19	0.18
	50mm Gyproc Thermaline Basic	0.24	0.22	0.20
100mm Aglite	50mm Gyproc Thermaline Super	0.21	0.19	0.18
	50mm Gyproc Thermaline Basic	0.24	0.22	0.20
100mm Stranlite	50mm Gyproc Thermaline Super	0.21	0.20	0.18
	50mm Gyproc Thermaline Basic	0.25	0.23	0.21

PARTIAL CAVITY FILL

Brick outer leaf - 50mm (min) clear cavity 300mm (max) wall width		Kingspan TW50			Celotex tuff-R CW3000Z			Xtratherm XT/CW		
k - value		0.023			0.023			0.023		
Finish		40mm	45mm	50mm	40mm	45mm	50mm	40mm	45mm	50mm
100mm Fibolite	Lightweight Plaster	0.32	0.30	0.28	0.32	0.30	0.28	0.32	0.30	0.28
	Plasterboard on dabs	0.31	0.29	0.27	0.31	0.29	0.27	0.31	0.29	0.27
100mm Aglite	Lightweight Plaster	0.33	0.31	0.29	0.33	0.30	0.29	0.33	0.31	0.29
	Plasterboard on dabs	0.32	0.30	0.28	0.32	0.29	0.28	0.32	0.30	0.28
100mm Stranlite	Lightweight Plaster	0.34	0.31	0.29	0.34	0.31	0.29	0.34	0.31	0.29
	Plasterboard on dabs	0.33	0.30	0.29	0.32	0.30	0.28	0.32	0.30	0.28

Part L requirement for dwellings

The 2006 amendments to Part L1 seek to achieve about a 20% reduction in carbon emissions when compared to dwellings built to the 2002 standards of thermal insulation. Compliance can only be demonstrated using a revised Government's Standard Assessment Procedure (SAP 2005) calculation procedure. There has been a move away from prescriptive 'U' values for the various individual components of the building, to the energy efficiency of the building as a whole.

However, the Elemental 'U' value route may be used to show compliance with Part 1LB work in existing dwellings. Walls must achieve a U value of 0.30W/m²K.

SAP 2005 & EMISSION RATES

The use of SAP 2005 will result in the reporting of CO² emissions from:

- Space and water heating, (CH) and
- The use of internal fixed lighting (CL).

The Target Emission Rate (TER) will need to be determined. This is calculated using approved software based on SAP 2005 and is, in turn, based upon a notional building which assumes a 20% improvement on the 2002 regulation design values.

The following formula is used to determine the TER.

$$\text{TER} = (\text{CH} \times \text{fuel factor} + \text{CL}) \times (1 - \text{improvement factor})$$

The fuel factor is a tabulated value from the Approved Document and is dependant on the fuel type.

The Dwelling Emission Rate (DER) is calculated based on the energy features of the proposed dwelling. It needs to be carried out twice.

First based on the 'as designed' construction for submission to Building Control. Second on 'completion' taking into account the actual construction and services, as well as the actual air permeability found from site tests. Neither value should be worse than the TER for the dwelling to comply.

AIR TIGHTNESS

The air permeability of a dwelling greatly affects the SAP rating; the lower the air permeability figure, the better DER rating is achieved. SAP 2005 software defaults to an air permeability figure of 10m³/h.m². By physically pressure testing a dwelling for air leakage, the builder may improve the SAP rating of the construction by lowering the air permeability figure in the calculation.

KEY DESIGN CONSIDERATIONS

The following considerations will need to be addressed in the design of new buildings in order to demonstrate compliance with the SAP method of compliance.

▶ Building type and configuration

▶ Glazing and orientation (solar gain)

▶ Thermal bridging detail

▶ Space heating and hot water provision, boiler type and efficiency (%)

▶ Ventilation (natural or mechanical)

▶ Fixed lighting - internal and external

▶ Airtightness of the building fabric

Complying with Part L

Once the TER has been calculated compliance is met by following five criteria.

Stage 1

Check (by calculation) that the predicted rate of carbon dioxide emissions from the dwelling (DER) is not greater than the Target Emissions Rate (TER).

Stage 2

The dwelling fabric and the fixed services should have performance values no worse than the specified design limits.

Stage 3

The dwelling should include appropriate passive control measures to limit the effect of solar gains on indoor temperatures.

Stage 4

The performance of the dwelling, as built, is consistent with the DER. This requires a check to ensure that any changes in performance and specification of materials between design and construction do not affect the TER. A final calculation of the DER is required to confirm compliance.

Stage 5

Information concerning the energy efficient operation of the dwelling should be provided to the occupier. This will include set/s of operating and maintenance instructions produced in such a way that householders can understand. This information is intended to be included as part of the 'Home Information Pack'.

